

Site Engineering Report

Gjyliqi Residence
16 Ox Ridge Road
Darien, Connecticut

Prepared for:
Vebi Gjyliqi
5 Gracie Lane
Darien, CT

Date Prepared:
October, 2020

Prepared by:
DiVesta Civil Engineering Associates, Inc.

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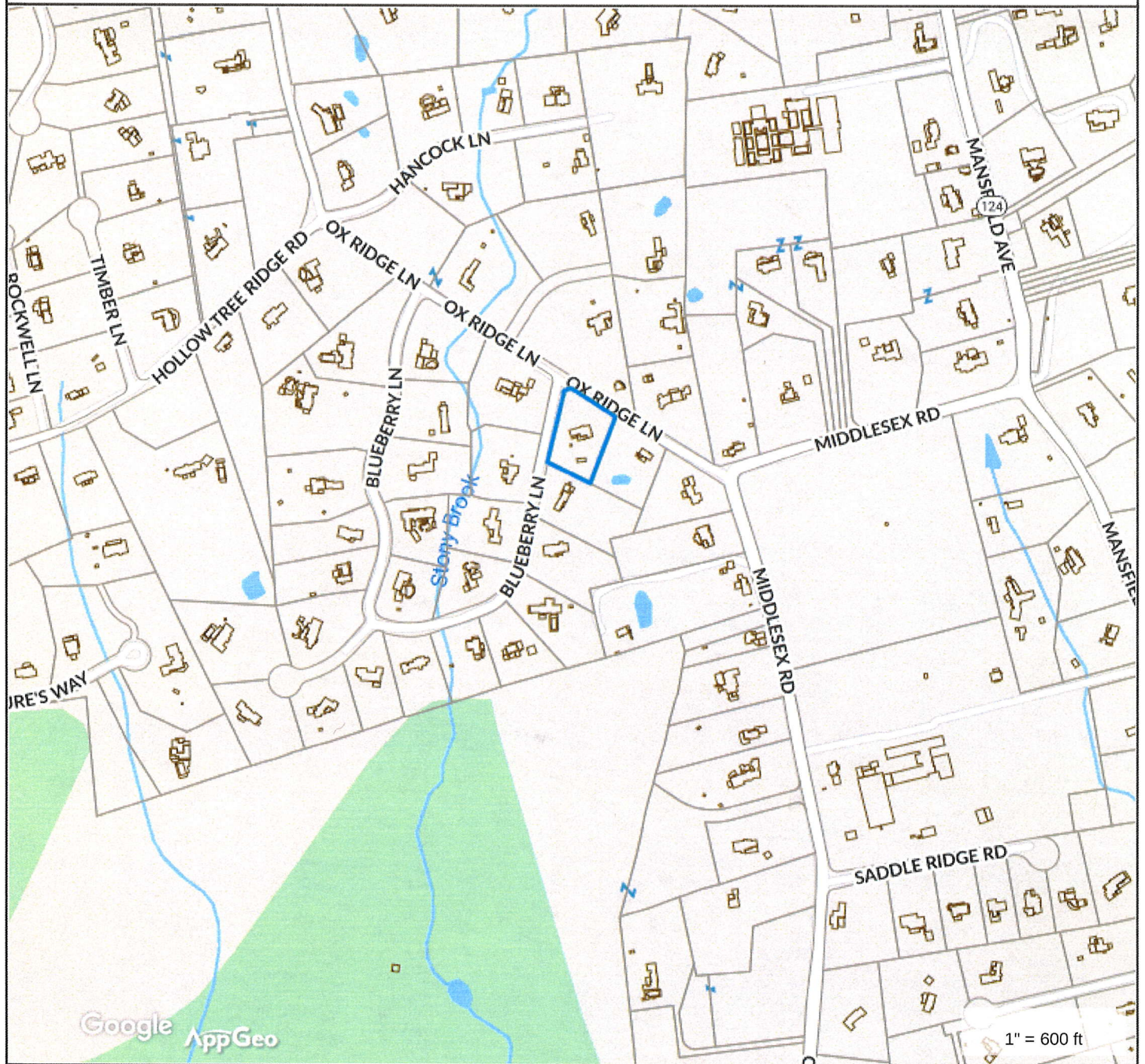
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16 Ox Ridge Lane



Property Information

Property ID 09532
Location 16 OX RIDGE LANE
Owner GJYLIQI VEBI



MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of Darien, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 8/1/2019
Data updated 8/1/2019

Introduction

This report has been prepared to present technical information in support of razing the existing residence and constructing a new single family residence in the same general location as the existing, installing a pool, pool patio, a new on-site subsurface sewage disposal system and stormwater management systems at 16 Ox Ridge Road, located in the R-2 zone of Darien.

Existing Site Conditions

The subject property is located at 16 Ox Ridge Road on the southeast corner of Blueberry Lane. The property has a total lot area of $1.4352 \pm$ acres or $62,519 \pm$ square feet. Currently access to this property is via two gravel driveways, one from Ox Ridge Road and the other from Blueberry Lane.

The property is a corner lot with residential properties to the south and east.

The parcel slopes mildly from east to west towards Blueberry Lane. The existing house was located in the central portion of the property with mature trees surrounding the residence. Also there was an outbuilding on the property used as a stable at one time.

Regulated Activity

There are no wetlands on the project site based on a soil report from Steven Danzer, PhD & Associates, LLC dated June 27, 2018. According to the Town of Darien's Inland Wetlands map there are wetlands located on adjoining properties therefore we are basing the upland review area on wetlands being at the property line.

Project Description

The proposal for this site consists of razing the existing residence and the stable and constructing a single family dwelling, installing a new driveway from Blueberry Lane to access the garage, also installing a new driveway from Ox Ridge Road to access a parking courtyard in front of the house. Other work associated with this project will include the installation of a pool, pool patio, site grading and the installation of a subsurface sewage disposal system and two subsurface stormwater management systems to control the post development runoff.

Stormwater Management

Based on the existing topography the runoff from this site typically drains from east to west towards Blueberry Lane. In developing the pre-development hydrology we assumed the property to be a vacant lot consisting of lawn.

Developed Site Runoff Characteristics

Development of the site will include the construction of a new single family residence, installation of two driveways, a parking courtyard in front of the house and the

installation of a pool. The analysis that was conducted on this site was to compare the pre-development conditions which consist of an undeveloped parcel of land and compare it to the post-development conditions which will consist of the proposed house, parking courtyard and driveways, pool, pool patio and other impervious areas and lawn. The goal for the project is to manage the runoff so that post-development peak rate of runoff will be equal to or less than pre-development peak rate of runoff.

It is proposed to collect the runoff from the proposed residence, parking courtyard, driveways, pool patio and a portion of the lawn and direct it into one of two subsurface detention systems. The proposed detention system located in the northwest corner of the property will consist of 10 rows of 22 units each of Recharger 150. The outlet flow will be metered out through a control release structure to the proposed finished grade where it will sheet flow in a westerly direction. The second detention system is located south of the proposed driveway from Blueberry Lane. The detention system will collect the runoff from the channel drain and some lawn area. The detention system will consist of 6 units of Cultec C-4. The outlet flow will be metered out through a control release structure to the proposed finished grade where it will sheet flow in a westerly direction. Adding the outlet flows from the detention systems to the remaining flows from the site provides a flow that is equal to or less than pre-development flows for all design storms. (Please see the chart below for a summary of our findings.)

The methodology used to determine the peak rate of runoff was TR-20 computer model by HydroCAD. The 2, 10, 25 and 50 year, 24-hour design storms were used for the analysis of this property. We calculated the runoff for the whole site to determine the peak rate of runoff from the site. We looked at the pre-development conditions and then compared it to the post-development conditions with and without detention.

Summary:

	2 Year Design Storm (CFS)	10 Year Design Storm (CFS)	25 Year Design Storm (CFS)	50 Year Design Storm (CFS)
Pre Development	2.01	4.04	4.92	5.81
Post Development	1.22	2.51	3.19	3.58

Based on our findings the post-development peak rate of runoff from the proposed site plan will be less than or equal to pre-development conditions for the 2, 10, 25 and 50-year design storms.

Site Utilities

On-Site Subsurface Sewage Disposal System

A series of deep test holes were excavated over portions of this site to determine the character of the soil profile, groundwater elevations, mottling, hardpan and ledge rock

elevations to determine the feasibility of developing an on-site sewage disposal system to serve the proposed dwelling. Percolation tests were also conducted on the parcel within the area of the proposed leaching system.

The lot was checked for MLSS (Minimum Leaching System Spread) and it was determined that the lot can meet the minimum spread requirement for a five (5) bedroom residence. Due to marginal soil conditions all of the system will be placed in select fill as well as placing select fill 25 feet down gradient of the leaching product. MLSS calculations determined that the surrounding naturally occurring soils and the select fill can adequately absorb, treat and disperse the expected volume of sewage effluent.

Adequate space was found for the primary leaching area.

Water

The site is served by an on-site well.

Sedimentation & Erosion Control Narrative

Reference is made to the Sedimentation and Erosion Control Plan drawing, which, along with this text is included in the report, part of the Sedimentation and Erosion Control Plan for this project. All erosion controls are to follow the 2002 CT Guideline for Soil Erosion and Sediment Control.

Sedimentation and erosion controls for the lot will consist of silt fence placed on the down gradient side of all cut and fill areas and the installation of anti-tracking pads at the end of the two proposed driveways. Once the catch basins and the yard drain are installed the haybales are to be placed around the grates and the grates are to be wrapped with filter fabric. Sedimentation and erosion controls shown on the plan are specific to this property.

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Appendix A:

**Stormwater Management
Operation and Maintenance
Plan**

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Stormwater Management
Operation and Maintenance Plan
For
16 Ox Ridge Road
Darien, Connecticut
October 28, 2020

The object of the stormwater management operation and maintenance plan is three fold; 1) is to collect the runoff from the driveway areas, parking courtyard, pool patio, roof areas and a portion of the lawn area and convey the runoff into the subsurface detention systems, 2) once the runoff has been collected and conveyed to the subsurface detention systems the flow will be metered out to be equal to or less than pre development conditions, 3) the detention systems will detain the water quality volume for the first inch of runoff and the increase in runoff from the driveways and the parking court and the entire roof area along with a portion of the lawn area.

Maintenance Measures

1. Inspect the catch basins and yard drain sumps annually for any accumulation of sediment. If there is any accumulated sediment it shall be removed by hand.
2. Inspect the channel drain on a regular basis to insure that the drain is not clogged or filled with sediment.
3. Inspect the junction boxes to insure that they are not clogged with debris and remove any accumulated debris.
4. Inspect during regular lawn maintenance that the overflow grates are clear.
5. Inspect annually the roof drains to ensure that they are clear and free of buildup debris and that there are no blockages and that the pipes are free flowing.
6. Removal of any accumulated sediment will ensure that the detention systems will function properly.

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Appendix B:

Hydrology Calculations

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Appendix C:
Web Soils/Soils Report

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STEVEN DANZER, PHD & ASSOCIATES LLC

Wetlands & Environmental Consulting

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203 451-8319

WETLAND BOUNDARIES • POND & LAKE MANAGEMENT • CONSTRUCTION FEASIBILITY CONSULTATIONS • ENVIRONMENTAL STUDIES

Soil Report

Date: June 27, 2018

By: Steven Danzer Ph.D.

- Soil Scientist – Certified Nationally by the Soil Science Society of America (#353463).
– Registered with the Society of Soil Scientists of Southern New England.
- Professional Wetland Scientist - PWS #1321, Society of Wetland Scientists.
- Arborist - CT DEEP License S-5639.
- Ph.D. - Renewable Natural Resource Studies.

Re: 16 Ox Ridge Lane, Darien, CT.

INTRODUCTION

A wetlands investigation was performed the above-referenced property to locate and identify any inland wetland soils or watercourses.

The purpose of this report is to document that the field work for the site investigation was conducted using professionally accepted methods and procedures. This report is intended for submission by the owner(s) of the property or their designated agent to the local municipal regulatory agency.

There were no wetlands or watercourses on the property.

DEFINITIONS

The Connecticut General Statutes Ch. 440 Sections 22a-36 and 22a-45 (as amended) define **inland wetlands** as land, including submerged land (except for tidal wetlands) which consist of any of the soil types designated by the National Cooperative Soil Survey as *poorly drained*, *very poorly drained*, *floodplain*, or *alluvial*.

Poorly drained and **very poorly drained** are soil drainage classes that are defined by specific technical criteria in the Soil Survey Manual, Ch. 3 of the USDA Natural Resources Conservation Service. Generally speaking, *poorly drained soils* are wet at shallow depths periodically during the growing season, or remain wet for long periods, while in *very poorly drained soils* water is removed from the soil so slowly that free water remains at or very near the ground surface during much of the growing season.

Floodplain refers to the land bordering a stream or river that is subject to flood stage inundation, and **alluvial** refers to soil deposited by concentrated running water (Soil Survey Manual, Part 629).

Watercourses are defined by the Connecticut General Statutes Ch. 440 Sections 22a-36 and 22a-45 (as amended) to include rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private. **Intermittent watercourses** are a type of watercourse that typically do not flow year-round, and are specifically defined within the CT statutes by the presence of a defined permanent channel and bank, and the occurrence of two or more of the following characteristics:

- a) Evidence of scour, or deposits of recent alluvium or detritus;
- b) The presence of standing or flowing water for a duration longer than a particular storm incident;
- c) The presence of hydrophytic vegetation.

Uplands are land areas that are not inland wetlands, watercourses, or subject to tides.

The **soil series** is a soil label that refers to the lowest category of the National Soil Classification System. It is used as a specification for identifying and classifying soils within a soil map unit. The descriptions are standardized by the USDA-NRCS, and contain soil properties that define and distinguish them from the other soil series.

METHODS

All soils were sampled to a depth of at least 20 inches with spade and augur unless noted otherwise during a field investigation conducted on June 26, 2018. Soils were classified according to the nomenclature presented within the NRCS Web Soil Survey, with additional reference to the National Cooperative Soil Survey, and the Fairfield County Soil Survey.

There were no wetlands or watercourses on the property. However, there were wetlands located off site to the east, within proximity to the property boundary. Since they were not on the property, they were not flagged.

SITE DESCRIPTION AND DISCUSSION

The roughly 1.63 acre site is located on the south side of Ox Ridge Lane, Darien, on the southeast corner of Ox Ridge and Blueberry Lane. Land use is residential. A horse paddock/barn is located in the rear yard. The site is located within the DEEP Basin # 7402-03-1, in the Darien River subregional basin.

There were no wetlands or watercourses on the property.

However, there was a ditch and/or intermittent watercourse, possibly of manmade origin, located off site as per my understanding of the plot plan property boundaries. The offsite ditch and/or intermittent watercourse was located east of the horse barn/paddock, and paralleled the eastern property boundary in a southerly direction. There also appeared to be forested wetlands located offsite to the east, also east of the horse barn/paddock. Neither of these areas were flagged as they were believed to be offsite.

Soils on the site were **upland** soils, best classified as a mixed mapping unit of *Udorthents* (upland soils altered by cutting and filling) and *Ninigret and Tisbury soils*, 0 to 5 percent slopes (soil unit 21A).

LIMITATIONS

All observations and conclusions within this report are opinion and were based upon the field conditions at time of investigation and best professional judgment, as well as an approximate understanding of property boundaries. Field conditions may change over time. All wetland boundary lines established by the undersigned Soil Scientist are subject to change until officially adopted by the appropriate local, state and federal regulatory agencies.

CERTIFICATION

Signed,



Steven Danzer Ph.D., Certified Professional Soil Scientist (CPSS #353463)



Steven Danzer PhD and Associates LLC
www.CTWetlandsConsulting.com
203-451-8319

Soil Map—State of Connecticut
(16 Ox Ridge Road)



Soil Map may not be valid at this scale.

73° 29' 24" W



Map Scale: 1:1,190 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84








































Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

7/14/2020
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MAP LEGEND

 Area of Interest (AOI)	 Spoil Area
 Area of Interest (AOI)	 Stony Spot
 Soil Map Unit Polygons	 Very Stony Spot
 Soil Map Unit Lines	 Wet Spot
 Soil Map Unit Points	 Other
Special Point Features	 Special Line Features
 Blowout	Water Features
 Borrow Pit	 Streams and Canals
 Clay Spot	Transportation
 Closed Depression	 Rails
 Gravel Pit	 Interstate Highways
 Gravelly Spot	 US Routes
 Landfill	 Major Roads
 Lava Flow	 Local Roads
 Marsh or swamp	Background
 Mine or Quarry	 Aerial Photography
 Miscellaneous Water	
 Perennial Water	
 Rock Outcrop	
 Saline Spot	
 Sandy Spot	
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 20, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 21, 2014—Aug 27, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
12	Raypol silt loam	4.7	78.2%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	0.0	0.0%
84C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes	0.1	1.5%
103	Rippowam fine sandy loam	0.1	0.9%
701A	Ninigret fine sandy loam, 0 to 3 percent slopes	1.2	19.4%
Totals for Area of Interest		6.0	100.0%

State of Connecticut

12—Raypol silt loam

Map Unit Setting

National map unit symbol: 9ljx

Elevation: 0 to 1,200 feet

Mean annual precipitation: 43 to 54 inches

Mean annual air temperature: 45 to 55 degrees F

Frost-free period: 140 to 185 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Raypol and similar soils: 80 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Raypol

Setting

Landform: Depressions, drainageways

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss

Typical profile

Ap - 0 to 8 inches: silt loam

Bg1 - 8 to 12 inches: very fine sandy loam

Bg2 - 12 to 20 inches: silt loam

Bw1 - 20 to 26 inches: silt loam

Bw2 - 26 to 29 inches: very fine sandy loam

2C1 - 29 to 52 inches: stratified very gravelly coarse sand to loamy fine sand

2C2 - 52 to 65 inches: stratified very gravelly coarse sand to loamy fine sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat):

Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: C/D

Ecological site: Wet Outwash (F144AY028MA)

Hydric soil rating: Yes

Minor Components**Haven**

Percent of map unit: 5 percent

Landform: Outwash plains, terraces

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Enfield

Percent of map unit: 5 percent

Landform: Terraces, outwash plains

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Ninigret

Percent of map unit: 3 percent

Landform: Outwash plains, terraces

Down-slope shape: Linear

Across-slope shape: Concave

Hydric soil rating: No

Tisbury

Percent of map unit: 2 percent

Landform: Outwash plains, terraces

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: No

Scarboro

Percent of map unit: 2 percent

Landform: Depressions, drainageways, terraces

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Walpole

Percent of map unit: 2 percent

Landform: Depressions on terraces, drainageways on terraces

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Unnamed, loamy substratum

Percent of map unit: 1 percent

Data Source Information

Soil Survey Area: State of Connecticut

Survey Area Data: Version 20, Jun 9, 2020

State of Connecticut

701A—Ninigret fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2y07d

Elevation: 0 to 1,260 feet

Mean annual precipitation: 43 to 54 inches

Mean annual air temperature: 45 to 55 degrees F

Frost-free period: 140 to 185 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Ninigret and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ninigret

Setting

Landform: Outwash terraces, kames, moraines, outwash plains, kame terraces

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Base slope, tread

Down-slope shape: Linear, convex

Across-slope shape: Concave, convex

Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

Typical profile

Ap - 0 to 8 inches: fine sandy loam

Bw1 - 8 to 16 inches: fine sandy loam

Bw2 - 16 to 26 inches: fine sandy loam

2C - 26 to 65 inches: stratified loamy sand to loamy fine sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 18 to 38 inches to strongly contrasting textural stratification

Natural drainage class: Moderately well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to high (0.14 to 14.17 in/hr)

Depth to water table: About 17 to 39 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C

Ecological site: Moist Silty Outwash (F144AY026CT)

Hydric soil rating: No

Minor Components**Merrimac**

Percent of map unit: 5 percent

Landform: Moraines, kames, eskers, outwash terraces, outwash plains

Landform position (two-dimensional): Shoulder, summit

Landform position (three-dimensional): Side slope, crest, tread

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Agawam

Percent of map unit: 5 percent

Landform: Moraines, outwash terraces, outwash plains, kame terraces, kames

Landform position (two-dimensional): Shoulder, summit

Landform position (three-dimensional): Side slope, crest, tread

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Tisbury

Percent of map unit: 3 percent

Landform: Outwash terraces, outwash plains, deltas, valley trains

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: No

Raypol

Percent of map unit: 2 percent

Landform: Depressions, drainageways

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Data Source Information

Soil Survey Area: State of Connecticut

Survey Area Data: Version 20, Jun 9, 2020